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A BRIEF REVIEW OF DENTAL TREATMENT ISSUES FOR HEART DISEASE PATIENTS

Abstract**:** *Patients with cardiovascular disease (CVD) make up a sizable portion of the patients that dental therapists treat. There is a well-established link between heart disease and dental health. Arterial hypertension, heart failure, ischemic heart disease, cardiac arrhythmias, infective endocarditis, stroke, and cardiac pacemakers are among the common cardiac conditions seen in dentistry offices. Dental therapy is significantly hampered by patients with CVDs. To deliver safe and successful dental treatment, these patients require extra considerations and a thorough understanding of the underlying cardiovascular condition. A suitable change in dental treatment is essential depending on the heart status. Including the patient's cardiologist in a multidisciplinary approach may help to enhance dental treatment outcomes and minimize problems. This review describes the steps to be taken for the best dental care and seeks to reveal the hazards related to the dental management of a cardiac patient.*

Keywords*: vasoconstrictor, myocardial ischemia, hypertension, dental care, cardiac arrhythmias, and anticoagulants*

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КРАТКИЙ ОБЗОР ПРОБЛЕМ СТОМАТОЛОГИЧЕСКОГО ЛЕЧЕНИЯ ПАЦИЕНТОВ С ЗАБОЛЕВАНИЯМИ СЕРДЦА

Аннотация: *Пациенты с сердечно-сосудистыми заболеваниями (ССЗ) составляют значительную часть пациентов, которых лечат стоматологи. Существует хорошо установленная связь между заболеваниями сердца и здоровьем зубов. Артериальная гипертензия, сердечная недостаточность, ишемическая болезнь сердца, нарушения сердечного ритма, инфекционный эндокардит, инсульт и кардиостимуляторы являются одними из распространенных кардиологических состояний, встречающихся в стоматологических кабинетах. Пациенты с ССЗ существенно затрудняют проведение стоматологического лечения. Для обеспечения безопасного и успешного стоматологического лечения эти пациенты требуют особого внимания и глубокого понимания основного сердечно-сосудистого заболевания. Адекватное изменение плана стоматологического лечения имеет важное значение и зависит от состояния сердца. Привлечение кардиолога пациента в рамках междисциплинарного подхода может помочь улучшить результаты стоматологического лечения и минимизировать осложнения. В этом обзоре описаны шаги, которые необходимо предпринять для оптимального стоматологического ухода, и предпринята попытка раскрыть риски, связанные со стоматологическим ведением кардиологического пациента.*

Ключевые слова: *сосудосуживающее средство, ишемия миокарда, гипертензия, стоматологическая помощь, аритмии сердца, антикоагулянты.*

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ЮРАК КАСАЛЛИКЛАРИ БЎЛГАН БЕМОРЛАРНИ СТОМАТОЛОГИК ДАВОЛАШ МУАММОЛАРИНИНГ ҚИСҚА ШАРҲИ

Аннотация: *Юрак-қон томир касалликлари (ЮҚТК) бўлган беморлар стоматологлар томонидан даволанадиган беморларнинг салмоқли қисмини ташкил этади. Юрак касалликлари ва тиш саломатлиги ўртасида яхши ўрнатилган боғлиқлик мавжуд. Артериал гипертензия, юрак етишмовчилиги, юрак ишемик*

касаллиги, юрак аритмиялари, инфекцион эндокардит, инсульт ва кардиостимуляторлар стоматология кабинетларида учрайдиган кенг тарқалган юрак касалликлари қаторига киради. ЮҚТК бўлган беморлар стоматологик даволашни сезиларли даражада қийинлаштиради. Хавфсиз ва муваффақиятли стоматологик даволаш учун бу беморлар алоҳида эътиборни ҳамда асосий юрак-қон томир касаллигини чуқур тушунишни талаб қилади. Стоматологик даволаш режасини юрак ҳолатига қараб мос равишда ўзгартириш муҳим аҳамиятга эга. Беморнинг кардиологини мутахассисларарo ёндашувга жалб қилиш стоматологик даволаш натижаларини яхшилашга ва асоратларни камайтиришга ёрдам бериши мумкин. Ушбу шарҳ оптимал стоматологик ёрдам учун зарур бўлган чора-тадбирларни тасвирлайди ва юрак касаллиги бўлган беморларни стоматологик бошқариш билан боғлиқ хавф-хатарларни очиб беришга ҳаракат қилади.

Калит сўзлар: *вазоконстриктор, миокард ишемияси, гипертензия, стоматологик ёрдам, юрак аритмиялари, антикоагулянтлар.*

Introduction.

Systemic cardiovascular diseases and oral health management are intricately intertwined, according to an assessment of dental treatment difficulties for individuals with heart disease. Since the evidence base is often updated as a result of ongoing clinical studies and research, which can present contradicting data, the literature highlights the significance of keeping up with developing guidelines [26]. Numerous studies emphasize the link between cardiovascular disease risk and dental health. Maintaining dental health may be essential to lowering cardiovascular risk, according to DeStefano et al., who find a potential correlation between dental disease and an increased risk of coronary heart disease and death [27]. Similarly, it is known that obesity is a major risk factor for both heart disease and periodontal disease, and that obesity-related disorders like diabetes make periodontal health and cardiovascular outcomes much more difficult [31].Particular precautions must be made while administering dental care for people who have systemic diseases including diabetes and systemic sclerosis. In support of individualized dental treatment plans for diabetic patients, Ship emphasizes the systemic and oral health consequences of diabetes [28]. Alantar et al. highlight the necessity of preventive and curative measures in their discussion of the difficulties faced by dentists caring for patients with systemic sclerosis, including problems relating to oral mucosa involvement, restricted mouth opening, and possible side treatment effects [30]. Particular difficulties arise for patients with valvular heart disease and those using anticoagulant medication. According to Levine et al., antithrombotic therapy in valvular heart disease necessitates cautious management, and because the evidence landscape is changing so quickly, doctors must regularly evaluate guidelines [26]. Given that oral infections can worsen systemic illnesses, such as heart disease, Rugg-Gunn emphasizes the significance of managing food in order to prevent dental caries [32]. As the growing use of anticoagulants complicates dental management, Isola et al. critically examine the literature for patients on anticoagulant therapy, emphasizing the need to balance bleeding risks with the necessity of successful dental interventions [34]. Particularly with species like nutritionally altered streptococci and Actinobacillus actinomycetemcomitans that can cause both endocarditis and endophthalmitis, the danger of infective endocarditis is still a major worry. Early detection and treatment of these infections are crucial, according to Binder et al. and Garibyan et al., with endocarditis being a crucial factor even in the absence of systemic symptoms [29, 33]. In order to reduce the risks associated with dental treatment for patients with heart disease, the literature emphasizes the need for a multidisciplinary strategy that includes rigorous systemic health assessment, medication management, and preventative measures. To maximize results and minimize problems in this susceptible group, ongoing evaluation of existing guidelines and customized treatment planning are crucial [26], [28], [30], and [34].

Any dental procedure begins with a review of the patient's medical history. In addition to changing the dental treatment strategy, a compromised medical status might have serious and occasionally fatal repercussions if ignored. The primary cause of death worldwide is cardiovascular disease [1–3]. An projected 17.9 million deaths globally in 2019 were attributed to cardiovascular illnesses, accounting for 32% of all fatalities [2]. As life expectancy rises and healthcare facilities undergo significant improvements, dentists are seeing an increasing number of older and medically compromised patients. Cardiovascular events are not uncommon in a dentist office, despite syncope being the most frequently reported medical emergency [4], [5, 6]. Therefore, it is crucial that dentists have the knowledge, abilities, and resources necessary to effectively handle such emergencies. Nonetheless, a dentist should not be afraid to get in touch with the patient's doctor to ask about the patient's medical history and to discuss the dental treatment plan, as the patient's current state of health is crucial in creating the plan. The possible cardiovascular issues that dentists face and their management techniques at a dental office are covered in this article.

Hypertension

One of the most prevalent chronic illnesses affecting people worldwide, arterial hypertension is a major cause of death.

Every year, almost 10.4 million people pass away from high blood pressure [7]. In uzbekistan ,

hypertension affects more than 5 million individuals [8]. Primary and secondary hypertension are two categories of hypertension. While secondary hypertension has identifiable causes such as hyperthyroidism, vascular disorders, and adrenal medullary dysfunction, primary or "essential" hypertension lacks an evident underlying cause [9]. In the United States, 90–95% of people with high blood pressure are classified as having "essential hypertension" [10]. An average of two or more high values obtained on two or more occasions is typically used to diagnose hypertension [11,12]. The arterial hypertension management guidelines were revised in 2018 by the European Society of Cardiology/European Society of Hypertension (ESC/ESH), which also includes blood pressure classification for all age groups starting at age 16 [13]. This categorization defines hypertension as having an office systolic blood pressure of 140 mm Hg or higher and a diastolic blood pressure of 90 mm Hg or higher. The 2017 ACC/AHA High Blood Pressure Clinical Practice Guidelines, which classified hypertension as systolic blood pressure (SBP) ≥130 mmHg or a DBP ≥80 mmHg, recommend a different classification than this one [14]. Both pharmacological and non-pharmacological therapies are available to treat hypertension. Dietary changes, consistent exercise, weight management, quitting smoking, and consuming less alcohol, salt, and caffeine are examples of non-pharmacological strategies [15,16]. Pharmacologically, antihypertensive medications are administered either alone or in combination to regulate blood pressure [17]. The majority of hypertension patients go undetected or untreated, despite improvements in diagnostic and treatment techniques. For both developing and developed countries, these cases represent a serious public health concern. The risk of myocardial infarction, cardiac failure, stroke, and kidney disease all rises sharply with elevated blood pressure. Problems in a dental setting may arise from undiagnosed or inadequately managed hypertension. Therefore, in order to provide effective and secure dental care, a comprehensive assessment of a hypertensive patient visiting a dental clinic is essential. Additionally, dentists can be extremely helpful in identifying and promptly referring individuals with hypertension to other medical professionals. For this reason, oral health care professionals should be knowledgeable about the most recent recommendations, as well as the measurement, diagnosis, and treatment of patients with hypertension. A thorough risk assessment of the patient is advised prior to any dental procedures. Assessing the likelihood of any adverse cardiovascular event during dental treatment requires a thorough evaluation of the patient, including a review of their medical and family history. Every patient at a dental office should have their vital signs, such as blood pressure and pulse, taken at each visit [18]. Furthermore, even during the procedure, blood pressure monitoring must be performed for hypertensive individuals with systemic problems [19]. The following are the American Dental Association's recommendations for adult hypertension patients' outpatient dental care [20]:

• hypertension patients whose blood pressure is less than 160/100 mmHg do not require any emergency or elective treatment modifications.

• For people whose blood pressure is greater than 160/100 mmHg, B.P. It is necessary to repeat measurements.

• If B.P. is decreased or falls within the doctor's approved range, the emergency or elective dental treatment can proceed. But if B.P. is determined to be greater than 160/100 mmHg, the patient should be referred to a physician and no elective dental care should be given.

• Blood pressure must be checked every 10 to 15 minutes throughout the process, and emergency care can be started if the SBP is 160 to 180 mmHg and the diastolic pressure is 100 to 109 mmHg.

• Prior to any procedure, the dentist should speak with the doctor if the SBP and/or DBP are proven to be greater than 180 and 109, respectively.

• Patients who have SBP >180 mmHg and/or DBP >110 mmHg must see a doctor right once, or if they are exhibiting symptoms, they must be sent for an urgent medical examination. With proper stress and anxiety management, short morning appointments are ideal. It may be beneficial to take anxiolytics, such as diazepam (5–10 mg), the night before and an hour before the dentist appointment. In order to prevent orthostatic hypotension, sudden post-procedural alterations should be avoided, particularly in elderly individuals. Heart patients may have unintended hemodynamic changes as a result of endogenous catecholamine release brought on by pain during a dental procedure [21]. Local anesthetics with vasoconstrictors, such as epinephrine, which prolong the anesthetic effect and enhance hemostasis, are used to reduce pain in order to prevent this problem. However, the use of epinephrine in cardiac patients is contentious because of its non-selective adrenergic profile, which raises blood pressure (BP) and heart rate (HR). However, in patients with managed hypertension and/or cardiovascular disease, 1 or 2 cartridges of local anesthetic with 1:80,000, 1:100,000, or 1:200,000 of epinephrine are deemed safe [22]. Thus, in hypertension individuals, a gradual injection technique, appropriate aspiration, and a small dose of vasoconstrictor (0.018 to 0.036 mg) [23] can prevent cardiovascular stimulation and systemic absorption of vasoconstrictor [24]. In hypertensive individuals, excessive intraoperative bleeding may be concerning, particularly during a lengthy surgical procedure or in patients on anticoagulants such as warfarin or pirin. Thus, it is important to limit the surgical region and evaluate appropriate coagulation [15]. Dental professionals should be well-

versed on antihypertensive medications, such as calcium channel blockers, angiotensin-converting enzyme (ACE) inhibitors, beta and alpha blockers, and diuretics. Better patient treatment is made possible by knowledge of the oral side effects [15,25] of these medications, such as xerostomia, gingival hyperplasia, lichenoid response, orthostatic hypotension, gingival hemorrhage, and loss of taste. Antihypertensive medications and medications frequently prescribed by dental professionals, such as NSAIDs (which reduce their antihypertensive effect) [15,26], epinephrine (which causes a sudden rise in blood pressure) [15,26], local anesthetics (which decrease the rate of amide metabolism) [15], sedatives (which increase sedation) [15], systemic antifungals, and opioids, can all result in drug-drug interactions. Patients with hypertension may benefit from more comprehensive and efficient dental care if drug interactions are understood and adverse effects are controlled [15]. 2.1 Hypertensive Crisis The 2003 Joint National Committee (JNC-7) report defines a "Hypertensive Crisis" as a substantial rise in either the diastolic blood pressure (DBP >120 mmHg) or the systolic blood pressure (SBP >180 mmHg) [27]. Hypertensive emergency (situations with imminent or progressive target organ dysfunction) and hypertensive urgency (situations without progressive target organ dysfunction) are further subdivided [27]. A hypertensive crisis may eventually occur in 1% to 2% of hypertension patients [28]. When a dental patient exhibits hypertensive emergency symptoms, they should be hospitalized right away to the intensive care unit for quick blood pressure control with parenteral antihypertensives to avoid or minimize organ damage [27, 28]. Low-dose oral antihypertensives are used to progressively lower blood pressure over the course of hours to days when hypertension is severe.

Whitecoat Hypertension (WCH) and Whitecoat Effect (WCE) Whitecoat hypertension is more common in the elderly population and can impact 15–30% of people [29]. In untreated individuals, WCH reports consistently high office blood pressure with normal out-of-office blood pressure [30]. White coat hypertension is not the same as the whitecoat effect. The whitecoat effect is a brief rise in blood pressure in a medical setting brought on by the alerting reaction to a physician or nurse [31, 32]. Both normotensive individuals and hypertensive patients may experience it. White coat hypertension has a lower incidence of cardiovascular events and hypertension-mediated organ damage (HMOD). However, recent studies have shown that it may be associated with increased risk for long-term cardiovascular issues [33,34]. In order to lower cardiovascular risk, patients with whitecoat hypertension are advised to make the required lifestyle changes and schedule frequent follow-up sessions with routine blood pressure checks conducted outside of the office. Whitecoat hypertensive patients with a high cardiovascular risk profile may also benefit from antihypertensive medication treatment [13]. A mismatch between myocardial oxygen demand and supply as a result of decreased cardiac blood flow is the hallmark of ischemic heart disease (IHD), also known as coronary heart disease (CHD) [35]. The most frequent cause of IHD is atherosclerotic plaque-induced coronary artery blockage. Coronary artery spasm, coronary arteritis, embolism, hypotension-related shock, etc. are additional reasons. IHD is sometimes referred to as coronary artery disease (CAD) due to its pathogenesis. IHD accounts for 16% of all fatalities worldwide, making it the top cause of mortality, according to WHO Global Health Estimates [36]. Furthermore, IHD is the cause of almost half of all coronary artery disease episodes in patients under 75. Males have a 49% chance of getting IHD after the age of 40, while females have a 32% chance [37]. IHD falls into one of two categories: acute coronary syndromes or chronic coronary syndromes. Acute myocardial infarction and unstable angina pectoris are examples of acute coronary syndromes (ACS). One kind of chronic coronary syndrome (CCS) is stable angina. To estimate the chance that the dental surgery will end without incident, dentists need to be well-versed in the significant risk factors linked to IHD and their degree of control. Age, male gender, family history, and co-morbidities such as kidney illness, thyroid disease, type I and type II diabetes are among the non-modifiable risk factors for IHD. Nonetheless, lipid problems, high blood pressure, smoking, alcohol, diabetes, obesity, and stress are among the most prevalent and changeable risk factors. The disease is typically asymptomatic in its early stages. However, symptoms develop as atherosclerosis worsens, particularly when there is an increase in oxygen demand due to physical or emotional stress. Ankle edema, chest pain (angina), exhaustion, and shortness of breath are possible symptoms. Myocardial ischemia without infarction or necrosis causes angina pectoris, which is characterized by abrupt onset, substernal chest discomfort. The left arm, left jaw, neck, teeth, or back may all experience pain. Dental pain can be mistaken for anginal pain that radiates to the mandible. Additionally, anxiety, worry, and discomfort increase the likelihood of an anginal attack in a dental setting . As a result, a dentist needs to be well-versed on the clinical signs of angina and how to treat it in a dental office. There are three types of angina: Prinzmetal, unstable, and stable. • Stable angina lasts less than 15 minutes and is brought on by emotional or physical stress. • Angina at rest that is more severe and persistent without any signs of necrosis is known as unstable angina. • At rest, Prinzmetal/variant angina is most frequently caused by coronary artery spasm. If one or more coronary arteries are completely blocked, the resulting prolonged ischemia and irreversible necrosis of myocar-

dial tissues develops, which ultimately results in myocardial infarction or heart attack. Resting electrocardiogram (ECG), stress ECG, coronary computed tomography angiography (CTA), stress cardiac magnetic resonance (CMR) perfusion imaging, positron emission tomography (PET), or single-photon emission computed tomography (SPECT) perfusion imaging are all used to diagnose IHD. Furthermore, invasive coronary angiography (ICA) is advised for the diagnosis and treatment of patients who have a high risk of IHD. (1) . No elective dental care should be provided within 30 days of a MI, according to emerging data in the management of cardiovascular disease. Any emergency care during this time should be provided in a hospital setting following a consultation with a doctor. Elective dental care might be cautiously administered after a month if the patient is symptom-free [18]. In a dental setting, patients with angina or a history of myocardial infarction are treated similarly. Patients with stable angina can safely have elective dental care, but those with unstable angina must be referred to a doctor almost once. Appointments should be brief in the morning. Angina can be precipitated by fear, pain, worry, and tension, so these factors should be minimized when an IHD patient is seeing the dentist. Endogeous catecholamines are reduced by the use of oral anxiolytics, nitrous oxide or intravenous sedation, and long-acting anesthetics such as bupivacaine to maintain profound local anesthesia. Vasoconstrictors should be used sparingly because they can raise heart rate due to absorption. It is advised to avoid intravascular injections with appropriate aspiration and to use vasoconstrictor concentrations of 1:100,000 or less. For dental treatments, patients with cardiovascular disease should not use more than one (2 mL) or two (4 mL) cartridges of 2% lidocaine with 1:100,000 epinephrine (0.018 to 0.036 mg of adrenaline) [23].

Conclusions.

Despite being seen as safe, dental treatment can be fatal if a patient's medical issues—particularly heart disorders—are disregarded. Many medical difficulties in the dentistry clinic can be avoided with a comprehensive medical and medication history from every patient at every session and a full understanding of the risk factors and clinical manifestations of various cardiac conditions. Potential risks during dental treatment for a cardiac patient can be reduced with the support of a thorough treatment plan created in conjunction with the patient's cardiologist. Every medication prescription, surgical procedure, and general management plan should follow the most recent standards and procedures available. A medical emergency that may arise while the patient is in the dental chair should also be recognized and handled carefully by the dentist. Any patient has stress before and during dental procedures, but cardiac patients may experience medical issues as a result. Therefore, it is possible to give pharmacologic medicines to these individuals in order to help them relax and reduce tension. Additionally, morning appointments are preferred because they are more restful and there is more time to handle any unforeseen circumstances. In order to provide this vulnerable group of dental patients with high-quality and secure dental care, the dentist must possess thorough understanding of cariac diseases and interdisciplinary planning backed by an evidence-based approach.

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ИНФОРМАЦИЯ ДЛЯ АВТОРОВ СТАТЕЙ
«Вестник Ассоциации пульмонологов Центральной Азии»

Журнал предназначен для пульмонологов, терапевтов, фтизиатров, врачей общей практики и смежных специальностей.

Для публикации принимаются статьи по проблемам респираторной медицины, организации пульмонологической и фтизиатрической помощи больным, медицинской реабилитации, фундаментальным исследованиям.

В журнале можно публиковать оригинальные статьи, обзоры, лекции, материалы съездов, конференций, диссертаций, а также информацию для практических врачей.

Материал должен содержать новые, ранее не опубликованные данные и соответствовать профилю журнала.

Редакционная коллегия журнала рецензирует все полученные материалы. Решение о включении статей и других материалов в очередной номер журнала принимает редакционная коллегия, которая оставляет за собой право производить сокращение и редакционные изменения рукописей.

Работы принимаются на русском и английском языках.

Требования к тексту:

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- поля: левое – 3 см, правое, верхние и нижнее – по 2 см;
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- все аббревиатуры и сокращения автор должен расшифровать при первом употреблении в тексте.

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- УДК, название (заглавными буквами) статьи, с новой строки – фамилия и инициалы автора(ов), с новой строки – полное название учреждения, город, страна;
- аннотации на русском, узбекском и английском языках (не более 150-200 знаков каждая), ключевые слова (5-10 слов);
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ВЕСТНИК

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